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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Zhengguo Li

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EXAMINER

ROBERTS, JESSICA M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/528,363	Applicant(s) LI ET AL.	
	Examiner JESSICA ROBERTS	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,18,22 and 23 is/are rejected.
- 7) ☒ Claim(s) 3-17 and 19-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/28/2008;03/05/2005;05/24/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claim 22 objected to under 37 CFR 1.75 as being a substantial duplicate of claim

23. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

3. Applicant is advised that should claim 22 be found allowable, claim 23 will objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

5. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 18-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Re claims 18-19, which recites, "...on the computed sleeping time..." It is unclear as to what is to be considered ..." sleeping time"? As best understood by the Examiner, the sleeping time, is nothing more than a time delay.

8. Re claims 20-21, fails to remedy the issue above, and thus claims 20-21 are too rejected as being indefinite.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim(s) 1-21 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent¹ and recent Federal Circuit decisions² indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example the method for controlling the rate for encoding a video sequence, including the steps of "determining a desired frame rate", "determining a target buffer level", and "determining a target bit rate" is of sufficient breadth that it

¹ *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

² *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

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would reasonably be interpreted as a series of steps completely performed mentally, verbally, or without a machine.

The Applicant has provided no explicit and deliberate definitions to tie the method for controlling the rate for encoding a video sequence, including the steps of “determining a desired frame rate”, “determining a target buffer level”, and “determining a target bit rate” to limit the steps to a particular apparatus or device.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1-2, 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., US-6,118,187 in view of Li et al., "A NOVEL RATE CONTROL SCHEME FOR VIDEO OVER THE INTERNET".

Regarding **claim 1**, Wang teaches A method for controlling the rate for encoding a video sequence, wherein the video sequence comprises a plurality of Group Of Pictures, wherein each Group of Picture comprises at least an I-frame and an Inter-frame, the method comprising the following for the encoding of each Inter-frame in the Group of Picture: Determining a desired frame rate based on an available bandwidth of a channel which is used for transmitting the video sequence and on available computational resources for the encoding process (The target frame size for the current P-frame is determined from the time elapsed between the current P-frame and the previous frame and the amount of total available bandwidth, col. 7 line 50 to col. 8 line 1). Wang is silent in regards to Determining a target buffer level based on the desired frame rate and the position of the Inter-frame with respect to the I-frame; and Determining a target bit rate based on the target buffer level and the available channel bandwidth, wherein the target bit rate is used for controlling the rate for encoding the video sequence.

However Li teaches determining a target buffer level based on the desired frame rate (Li teaches let $B_c(n)$ denote the buffer level at time n . It can be know from the fluid-flow traffic model that $B_c(n+1)=\max(0, B_c(n)+T(n)-u(n)/Fr, \}$, where $T(n)$ is the actual bit rate, Fr is the frame rate, and $u(n)$ is the channel rate, this is illustrated in fig. 1, see 2. Two Basic Models) and the position of the Inter-frame with respect to the I-frame (see 3.2 Frame-layer Rate control); and Determining a target bit rate based on the target buffer level and the available channel bandwidth, wherein the target bit rate is used for controlling the rate for encoding the video sequence (Li teaches let $B_c(n)$ denote the

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buffer level at time n . It can be known from the fluid-flow traffic model that $B_c(n+1) = \max(0, B_c(n) + T(n) - u(n)/F_r)$, where $T(n)$ is the actual bit rate, F_r is the frame rate, and $u(n)$ is the channel rate, this is illustrated in fig. 1. Equation (1) can be regarded as the fluid-flow traffic model for the dynamics of the buffer and it will be used to determine the target bit rate for each frame, 2. Two Basic Models. Since Li discloses to use equation (1), which includes determining the buffer level based on the frame rate, channel rate and actual bit rate, and is used to determine the target bit rate for each frame, it is clear to the Examiner that the target bit rate is based on the buffer level, frame rate, channel rate and actual bit rate).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Li with Wang for providing improved rate control.

Regarding **claim 22**, see the rejection and analysis made for claim 1, except this is a claim to an apparatus with the same limitations as claim 1. Thus the rejection and analysis made for claim 1 also applies here.

Regarding **claim 23**, see the rejection and analysis made for claim 1, except this is a claim to a video encoding device with the same limitations as claim 1. Thus the rejection and analysis made for claim 1 also applies here.

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13. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., US-6,118,187 in view of Li et al., "A NOVEL RATE CONTROL SCHEME FOR VIDEO OVER THE INTERNET" and further in view of Nago et al., US-6,567,117.

Regarding **claim 2**, Wang (modified by Li) as a whole teaches everything as claimed above, see claim 1. Wang is silent in regards to the method for rate control according to claim 1, further comprising: Determining a target encoding time interval for the Inter-frame; and Determining the desired frame rate based on the determined target encoding time interval.

However, Nago teaches determining a target encoding time interval for the frame (In response to a result of the encoding operation, the encoding time measurement unit 17 determines a time interval T required from picture encoding for each image (step S1), col.12 line 19-22); and determining the desired frame rate based on the determined target encoding time interval (In response to a result of such determination, the coding frame rate calculator 18 calculate how many frame can be produced per second, or coding frame rate for each image format. col.12 line 22-25).

14. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Nago with Wang (modified by Li) for providing improved image quality.

15. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., US-6,118,187 in view of Li et al., "A NOVEL RATE CONTROL SCHEME FOR VIDEO OVER THE INTERNET" and further in view of Well Known Prior Art (Official Notice).

Regarding **claim 18**, Wang (modified by Li) is silent in regards to the method for rate control according to claim 1, further comprising: Determining a sleeping time of each frame after the frame is coded, Determining a starting encoding time of each of the frame based on the computed sleeping time, Determining a starting decoding time of a next frame based on the computed starting encoding time, and Transmitting the determined starting decoding time to a decoder which is designed for decoding the video sequences.

However, Official Notice is taken that both the advantage and benefit of providing the limitation as claimed, is notoriously well known and expected in the art, thus it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the limitation as claimed for providing improved rate control.

Allowable Subject Matter

16. Claims 3-17 and 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter: The present invention as claimed involves a method for controlling the rate for encoding a video sequence. The novel features include wherein the target encoding time interval for the Inter-frame is determined based on the available channel bandwidth and an average encoding time interval used for encoding the Inter-frame, wherein the average encoding time interval for the Inter-frame is proportional to the available computational resources for the encoding process.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

19. Liu et al., US-6,731,685 B1

20. Bishay et al., US-6,256,350

21. Pian et al., US-6,366,614

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA ROBERTS whose telephone number is (571)270-1821. The examiner can normally be reached on 7:30-5:00 EST Monday-Friday, Alt Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621

/Jessica Roberts/
Examiner, Art Unit 2621